

**REGIONAL TRANSPORTATION MITIGATION FEE
2008 FEE SCHEDULE UPDATE**

NEXUS STUDY REPORT

Prepared for:

Nevada County Transportation Commission

In Association with:

Nevada County
Nevada City
City of Grass Valley

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1.0 INTRODUCTION

The western Nevada County Regional Transportation Mitigation Fee (RTMF) program was established in 2001 through a partnership of Nevada County, Nevada City, the City of Grass Valley, and the Nevada County Transportation Commission (NCTC). The RTMF program has since collected development impact fees to help fund construction of the regional system of roads, streets, and highways needed to accommodate growth in the region and has helped to fund improvements to the regional roadway system serving western Nevada County.

Throughout its existence the RTMF program's structure and policies have remained essentially unchanged. However, some of the roadway improvements associated with the original RTMF program have been completed and plans for future development within western Nevada County have evolved. To reflect the accomplishments of the original RTMF program and the continuing changes in regional growth and transportation needs, NCTC has recently completed an update of the RTMF Capital Improvement Program (CIP). The RTMF CIP represents a fundamental element of the western Nevada County RTMF program. The RTMF CIP identifies the roadway improvements necessary to mitigate the transportation impacts of new development on western Nevada County and determines the cost associated with implementing the roadway system improvements identified, thus providing a core variable in the formula for calculating the fee levels for the RTMF program.

Changes in the RTMF CIP, which provides the underlying basis for the RTMF program, have necessitated the review and update of the RTMF program to reaffirm the nexus between projected development and needed transportation system improvements. The reevaluation of the RTMF nexus also provides the opportunity to address important policy issues including consideration of a new horizon year of 2030 and the related traffic growth attributable to new development in western Nevada County, inclusion of program administration costs, the breakdown of the region into fee zones, as well as the differentiation of fees by land use.

This Nexus Study report presents the evaluation of population and employment growth, future transportation needs and the availability of traditional transportation funding sources to establish updated RTMF fee levels and program revenue collection targets. This Nexus Study report is intended to satisfy the requirements of California Government Code Chapter 5 Section 66000-66008 Fees for Development Projects (also known as California Assembly Bill 1600 (AB 1600) or the Mitigation Fee Act) which governs imposing development impact fees in California.

Companion documents referenced in this report include the NCTC Regional Traffic Mitigation Fee Program – Capital Improvement Program Report (Fehr & Peers, October 18, 2007), the Regional Transportation Mitigation Fee Cost Estimates Report (Mark Thomas & Company, Inc., April 10, 2008), the Traffic Operations on SR 20 at Pleasant Valley Road and at Rough and Ready Highway Memorandum (Prism Engineering, April 7, 2008), and the City of Grass Valley Roadway Capital Improvement Program Update

2007. These documents that are directly related to the 2008 Fee Schedule Update are available from NCTC.

The following sub-sections provide some background information on NCTC's RTMF program including the provisions of state legislation related to mitigation fee programs. The remaining sections of the RTMF 2008 Fee Schedule Update Nexus Study report present the findings of the nexus study data analysis and the revised RTMF fee schedule.

1.1. Mitigation Fee Act and Other Legal Requirements

The Mitigation Fee Act, also known as California Assembly Bill 1600 (AB 1600) or California Government Code Sections 66000 et seq., governs imposing development impact fees in California. The Mitigation Fee Act requires that all local agencies in California, including cities, counties, and special districts follow some basic principles when instituting impact fees as a condition of new development. These principles are as follows:

1. Identify the purpose of the fee. (Government Code Section 66001(a)(1))
2. Identify the use to which the fee is to be put. (Government Code Section 66001(a)(2))
3. Determine that there is a reasonable relationship between the fee's use and the type of development on which the fee is to be imposed. (Government Code Section 66001(a)(3))
4. Determine how there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is to be imposed. (Government Code Section 66001(a)(4))
5. Discuss how there is a reasonable relationship between the amount of the fee and the cost of the public facility or portion of the public facility attributable to the development on which the fee is to be imposed. (Government Code Section 66001(b))

These principles closely emulate two landmark US Supreme Court rulings that each provide guidance on the application of impact fees. The first case, *Nollan v. California Coastal Commission* (1987) 107 S.Ct. 3141, established that local governments are not prohibited from imposing impact fees or dedications as conditions of project approval provided the local government establishes the existence of a "nexus" or link between the exaction and the state interest being advanced by that exaction. The *Nollan* ruling clarifies that once the adverse impacts of development have been quantified, the local government must then document the relationship between the project and the need for the conditions that mitigate those impacts. The ruling further clarifies that an exaction may be imposed on a development even if the development project itself will not benefit provided the exaction is necessitated by the project's impacts on identifiable public resources.

The second case, *Dolan v. City of Tigard* (1994) 114 S.Ct. 2309, held that in addition to the Nollan standard of an essential nexus, there must be a "rough proportionality" between proposed exactions and the project impacts that the exactions are intended to allay. As part of the Dolan ruling, the US Supreme Court advised that "a term such as 'rough proportionality' best encapsulates what we hold to be the requirements of the Fifth Amendment. No precise mathematical calculation is required, but the city (or other local government) must make some sort of individualized determination that the required dedication is related both in nature and extent to the impact of the proposed development."

The combined effect of both rulings is the requirement that public exactions must be carefully documented and supported. This requirement is reiterated by the provisions of the State of California Mitigation Fee Act and subsequent rulings in the California Supreme Court (*Ehrlich v. City of Culver City* (1996) 12 C4th 854) and the California Court of Appeals (*Loyola Marymount University v. Los Angeles Unified School District* 45 (1996) Cal.App.4th 1256).

This Nexus Study report is intended to satisfy the requirements of the State of California Mitigation Fee Act. Specifically, this Nexus Study report will outline the purpose and use of the RTMF, the relationship between new development and impacts on the transportation system, the estimated cost to complete necessary improvements to the regional street system within western Nevada County, and the 'rough proportionality' or 'fair-share' fee for differing development types.

2.0 FUTURE GROWTH AND THE NEED FOR THE RTMF

2.1. Future Growth Trends

The most recently available demographic projections for western Nevada County were developed by NCTC in consultation with member agencies to support the preparation of the NCTC TransCAD Traffic Model by Prism Engineering (2007). These projections have a base year of 2006 and a horizon year of 2030.

Based on the NCTC regional growth forecasts, the population of western Nevada County is projected to increase by 27,379 in the period between 2006 and 2030, a compounded rate of approximately 1.3% annually. During the same period, employment in western Nevada County is anticipated to grow by 11,200 or 1.5% annually. Table 2-1 summarizes socio-economic data for western Nevada County, while Table 2-2 shows the associated growth in daily trips forecasted by the NCTC TransCAD Traffic Model (Prism Engineering, 2007). As shown in Table 2-2, daily trips are expected to increase by 92,808 between 2006 and 2030, or 1.2% annually.

Table 2-1 Socio-Economic Data for Western Nevada County (2006-2030)

	2006	2030	Change	% Change	% Annual
Population	76,580	103,959	27,379	36%	1.3%
Households	33,900	46,760	12,860	38%	1.4%
Employment	25,300	36,500	11,200	44%	1.5%

Source: 2007 Long-Term Socio-Economic Forecasts by County, California Department of Transportation. NCTC TransCAD Traffic Model, Prism Engineering, 2007.

Table 2-2 Daily Trips to and/or from Western Nevada County (2006-2030)

	2006	2030	Change	% Change	% Annual
Daily Trips	281,464	374,272	92,808	33%	1.2%

Source: NCTC TransCAD Traffic Model, Prism Engineering, 2007.

2.2. Future Highway Traffic

To support the evaluation of the cumulative regional impacts of new development on the transportation system in western Nevada County, existing (2006) and future (2030) conditions on roadways of regional significance were analyzed and summarized in the NCTC Regional Traffic Mitigation Fee Program – Capital Improvement Program Report (Fehr & Peers, October 18, 2007). Fehr & Peers analyzed the level of service (LOS) of 31 intersections and 22 ramps during the AM and PM peak hours, as well as estimated the daily LOS of 27 roadway segments. The report is available from NCTC, and its results are summarized in Table 2-3 below.

Table 2-3 LOS on Regional Facilities in the NCTC RTMF Study Area (2006-2030)

Number Operating at Unacceptable LOS	2006	2030	Change	% Change
Intersections (31 locations)	3	18	15	48%
Highway Ramps (22 locations)	9	13	4	18%
Roadway Segments (27 locations)	5	13	8	30%
Total (80 locations)	17	44	27	34%

Note: LOS = level of service; AM and PM peak hours for intersections and ramps; daily for roadway segments.
 Source: NCTC Regional Traffic Mitigation Fee Program – Capital Improvement Program Report (Fehr & Peers, October 18, 2007)

As summarized by Table 2-3, the additional traffic generated by new development in western Nevada County will cause congestion on the regional roadway system to increase in the absence of additional highway infrastructure investments. Many facilities will experience a significant deterioration in LOS to unacceptable levels as a result of new development and the associated growth in traffic. According to the Highway Capacity Manual (Transportation Research Board, 2000), LOS C or D are required to “ensure an acceptable operating service for facility users.” NCTC and its Technical Advisory Committee have defined unacceptable level of service within western Nevada County as LOS E or F.

The need to mitigate the impact of new development is shown by the adverse impact that new development will have on regional roadways in western Nevada County. As a result of the new development and associated growth in population and employment in western Nevada County, additional pressure will be placed on regional roadways with the total number of locations operating at unacceptable level of service estimated to increase by 34% between 2006 and 2030. In addition, many of the locations already experiencing unacceptable LOS under existing conditions, deteriorate further under future conditions.

As shown in Table 2-3, by 2030 over one half of the locations analyzed are forecast to operate at LOS E or worse without substantial improvements to the regional roadway system. This highlights the continuing need to complete the improvements recommended in the RTMF CIP to mitigate the cumulative regional impact of new development.

The analysis summarized in Table 2-3 clearly demonstrates that the additional trips generated by future new development in western Nevada County will lead to increasing levels of traffic congestion on the regional roadway system. The need to implement the RTMF CIP to improve these roadways and relieve future congestion is therefore directly linked to the future development that generates the additional trips.

2.3. The RTMF Concept

All new development has some effect on the transportation infrastructure in a community, city or county due to an increase in the total number of trips. Increasing usage of the transportation facilities leads to more traffic, progressively increasing congestion and decreasing the level of service. In order to meet the increased travel demand and keep traffic flowing, improvements to transportation facilities become necessary to sustain pre-development traffic conditions.

The projected growth in western Nevada County can be expected to increase congestion and degrade mobility if further investments are not made in the transportation infrastructure. This challenge is especially critical for regional roadways that carry a significant number of the trips between cities and neighborhoods, since traditional sources of transportation improvement funding (such as the gasoline tax and local general funds) will not be nearly sufficient to fund the improvements needed to serve new development. Developer dedications generally provide only a portion of the improvements with improvements confined to the area immediately adjacent to the respective development.

The RTMF program establishes a uniform development impact fee to generate the revenues necessary to fully fund the implementation of the RTMF CIP resulting in construction of the regional roadway system needed to accommodate growth in the region. Recognizing that some improvements within western Nevada County will be completed by developer dedications or using alternate funding sources, the RTMF program establishes the share of unfunded improvement costs in rough proportionality to the number of trips generated by new development and assigns the fair-share fee to new developments on this basis.

A sizable percentage of trip-making for any given local community extends beyond the bounds of the individual community as residents pursue employment, education, shopping and entertainment opportunities elsewhere. As new development occurs within a particular local community, this migration of trips of all purposes by new residents contributes to the need for transportation improvements within their community and in the other communities of western Nevada County. The idea behind the RTMF program is to have new development throughout western Nevada County contribute equally to paying the cost of improving the transportation facilities that serve these trips within and between communities. For this reason, the RTMF revenues are used to improve transportation facilities that primarily serve trips within and between communities in western Nevada County (primarily arterial roadways and highway ramps).

Much, but not all, of the new trip-making in a given area is generated by residential development (i.e. when people move into new homes, they create new trips on the transportation system as they travel to work, school, shopping or entertainment). Some of the new trips are generated simply by activities associated with new businesses (i.e. new businesses will create new trips through the delivery of goods and services, etc.).

With the exception of commute trips by local residents coming to and from work, and the trips of local residents coming to and from new businesses to get goods and services, the travel demands of new businesses are not directly attributable to residential development. The RTMF program considers the relative impacts of different sources of new trip generation by assessing both residential and non-residential development for their related transportation impacts.

In summary, the RTMF concept includes the following:

- A uniform fee is levied on new development throughout western Nevada County to mitigate the cumulative regional impacts of trips generated by new development.
- The fee is assessed with rough proportionality on new residential and non-residential development based on the relative impact of each new use on the transportation system.

3.0 THE RTMF CIP AND COST ESTIMATES

The RTMF Capital Improvement Program (CIP) and cost estimates represent a fundamental element of NCTC's Regional Transportation Mitigation Fee program. The RTMF CIP identifies the roadway improvements necessary to sustain regional mobility within western Nevada County. The RTMF CIP describes the set of roadway improvements to be funded by the RTMF program and other regionally available funding sources, and prioritizes the implementation of these improvements. The costs associated with implementing the roadway system improvements identified in the RTMF CIP are a core variable in the formula for calculating the fee level for the RTMF program.

The RTMF CIP and cost estimates are stand alone documents updated by NCTC on a regular basis. Their most recent update was conducted as a separate study in parallel to this 2008 Fee Schedule Update Nexus Study. The most recent revision of the RTMF CIP and cost estimates was used as the basis for this 2008 Fee Schedule Update Nexus Study.

Table 3-1 lists the cost estimate for each project included in the RTMF CIP. These cost estimates were developed by Mark Thomas & Company, unless otherwise noted in the table. As shown in the table, projects in the RTMF CIP were divided into three categories: Tier 1, Tier 2, and State Highway. Projects in the Tier 1 and Tier 2 categories total approximately \$69.0 million. Three million dollars will be collected through the RTMF program to provide seed money for the projects in the State Highway category whose cost estimates total about \$212.1 million. **Figure 3-1** illustrates the location of the Tier 1 and Tier 2 projects included in the RTMF CIP.

Table 3-1 RTMF Capital Improvement Program (CIP)

#	LOCATION	PROPOSED IMPROVEMENT	COST ESTIMATE ****	TIER NUMBER & PROJECT PRIORITY	
1	Dorsey Drive Interchange	Construct new interchange.	\$34,950,000	Tier 1	1
2A	SR 49, south of McKnight Way	Widen highway consistent with design concepts approved by NCTC.	\$53,500,000	State Highway	15
2B	SR 49, south of La Barr Meadows Rd	Widen highway consistent with design concepts approved by NCTC.	\$27,700,000	State Highway	15
2C	SR 49, south of Alta Sierra	Widen highway consistent with design concepts approved by NCTC.	\$102,300,000	State Highway	15
2D	SR 49, south of Wolf Creek	Widen highway consistent with design concepts approved by NCTC.	\$26,200,000	State Highway	15
3	SR 49/ Combie Rd	Provide second southbound left-turn lane with receiving lane.	\$2,345,800	Tier 2	6
4A & 4B	SR 49 NB Ramps/ E McKnight Way & SR 49 SB Ramps/ W McKnight Way	Install roundabout.	\$5,499,457	Tier 2	8
6	SR 20 EB Ramps/ McCourtney Rd	Install single-lane roundabout or traffic signal.	\$1,290,215	Tier 2	11
10	SR 20/49 NB Ramps/ Idaho-Maryland Rd	Install signals.	\$1,143,935	Tier 2	10
11	SR 20/49 SB Ramps/ Idaho-Maryland Dr/ E Main St	Install two-lane roundabout.	\$2,600,000	Tier 1	2
12	SR 20/49 SB Ramps/ Brunswick Rd	Widen Brunswick Road and add second lane to on-ramp.	\$892,279	Tier 2	5
13A & 13B	Ridge Rd/ Gold Flat Rd/SR 20/49 NB Ramps; Ridge Rd/ Gold Flat Rd/ SR 20/49 SB Ramps; and Zion St/Ridge Rd	Install intersection improvements: roundabout or signals. Close spacing of intersections necessitates improvement at all three intersections.	\$4,000,000	Tier 1	4
14	SR 20/49 Golden Center Freeway, Bennett to Idaho-Maryland	Widen to improve capacity and safety and maintain acceptable LOS.	\$1,500,000	State Highway	15
15	SR 20/ SR 49/ Uren Street	Install signal with protected north-south phasing and eastbound right-turn overlap phasing.	\$902,400	State Highway	15
22 & 23	Brunswick Rd/ Loma Rica Dr & Brunswick Rd/ E Bennett St/ Greenhorn Rd	Provide solution for Loma Rica Dr/Brunswick Rd intersection future deficiency.	\$2,941,000	Tier 1	3
24	Brunswick Rd/ SR 174 Colfax Highway	Install signal and realign road.	\$4,269,200	Tier 2	12
29	E Main St/ Bennett St	Continue to collect for improvement constructed in original RTMF.	\$1,500,000	Tier 2	7
36	SR 20/ Rough and Ready Highway	Add an additional approach lane in both the WB and EB directions.	\$2,492,600	Tier 2	13
37	SR 20/ Pleasant Valley Rd	Restripe the SB approach to include a left-turn lane and a through/left-turn lane. Widen SR 20 to accommodate a second acceptor lane.	\$575,900	Tier 2	9
38	Dorsey Drive Extension	Extend two lane road from Sutton Way to Brunswick Rd.	\$4,529,602	Tier 2	14

**** Cost estimates per "Preliminary Cost Estimate Memo" prepared for NCTC by Mark Thomas & Company, Inc., April 10, 2008. Projects 11 and 38 (Dorsey Drive Extension) costs per City of Grass Valley Roadway Capital Improvement Program Update 2007. Projects 13A&13B and 22&23 updated per NCTC.

Figure 3-1 RTMF CIP Tier 1 and Tier 2 Project Locations

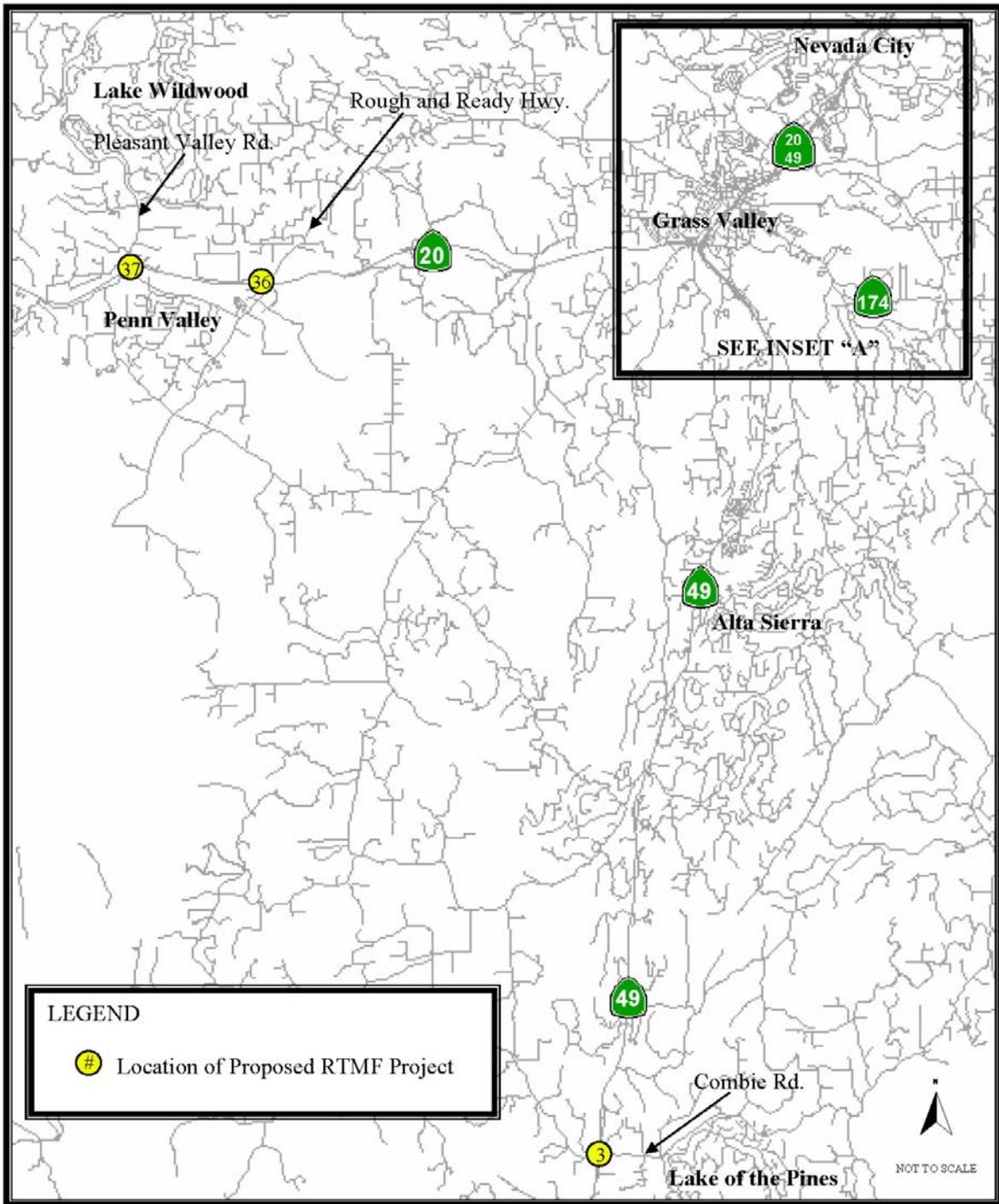
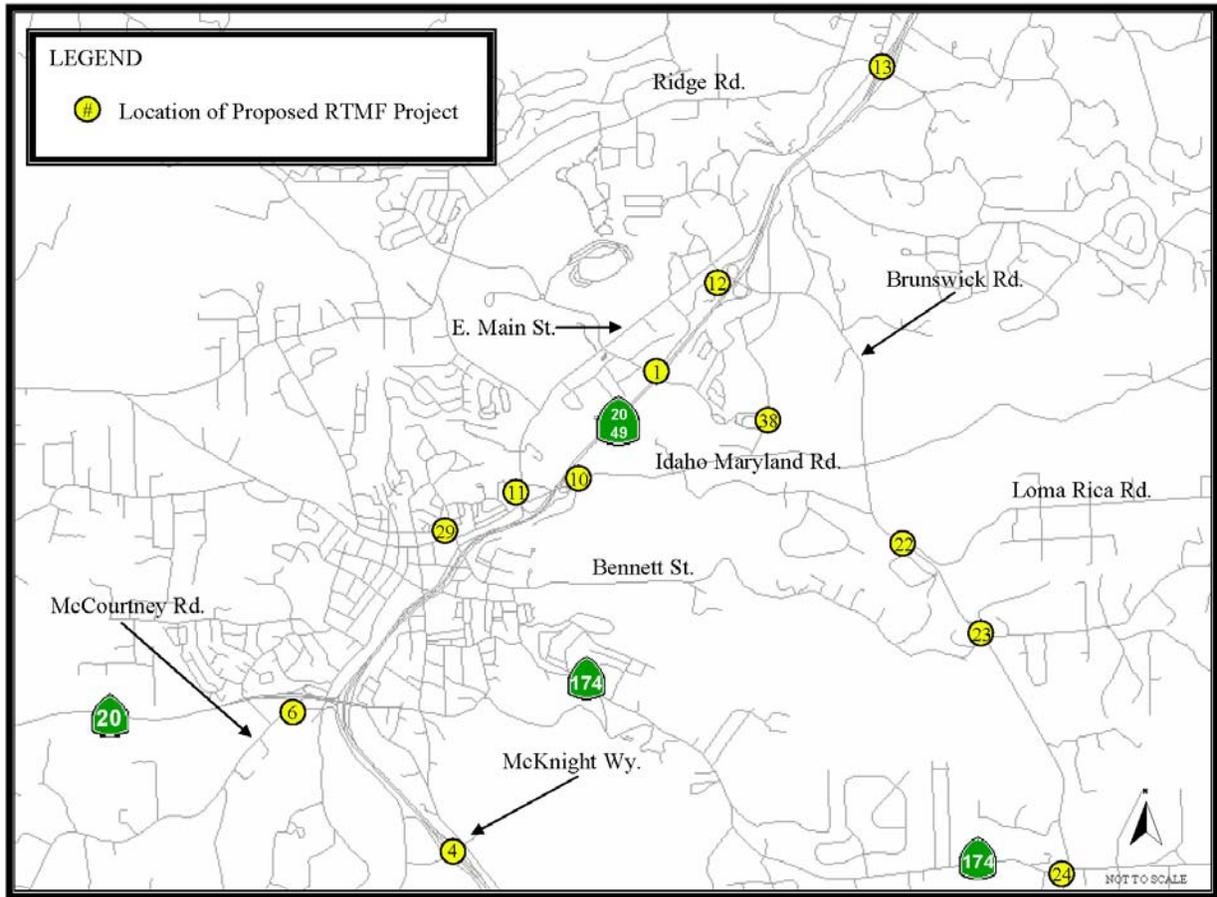


Figure 3-1 RTMF CIP Tier 1 and Tier 2 Project Locations (Continued – INSET A)



4.0 TRAFFIC GROWTH ATTRIBUTABLE TO NEW DEVELOPMENT

Traffic growth attributable to new development in the NCTC RTMF Collection Area is one of the two inputs which determine the RTMF Fee Schedule. Simply put, the RTMF collection target, described in a later section, is divided by the estimated traffic growth to develop the RTMF fee per trip. **Section 4.1** describes the methodology used to estimate traffic growth. **Section 4.2** describes the methodology for differentiating between residential and non-residential fee per trip rates.

4.1. Determining Traffic Growth

The NCTC TransCAD Traffic Model (Prism Engineering, 2007) provided the most comprehensive forecast of traffic growth in the NCTC RTMF Collection Area. Using the NCTC Model, traffic growth attributable to new development inside the RTMF Collection Area was estimated as follows:

- Trip growth as forecasted by the NCTC Model was determined (**Section 4.1.2**)
- NCTC Model forecasts were converted to project level forecasts (**Section 4.1.3**)

4.1.1. Background on NCTC Model

Developed by Prism Engineering in consultation with NCTC and its member agencies, the NCTC Model provides the best available quantitative estimate of travel occurring and expected to occur in the NCTC region. It is based upon estimates of socioeconomic and land use characteristics.

The modeling area includes Nevada City, the City of Grass Valley, and neighboring unincorporated areas of western Nevada County. Figure 4-1 illustrates the extents of the modeling area. The modeling area is divided up into numerous transportation analysis zones (TAZs) which provide the spatial unit (or geographical area) within which travel behavior and traffic generation are estimated. Most TAZs cover the “internal” modeling area, while several of them are cordons covering the area “external” to the modeling area. The cordon locations account for trips traveling to or from areas outside of western Nevada County.

The NCTC Model is periodically updated to better reflect current conditions. The updated NCTC Model used for this study produces origin-destination (O-D) tables for a 2006 base year, and a 2030 future year.

4.1.2. Determining Trip Growth Forecasted by the NCTC Model

The total traffic growth was estimated by subtracting the Year 2006 NCTC Model origin-destination (O-D) table from the Year 2030 one. The NCTC Model estimates the number of vehicle trips will grow by 92,808 trips, or 33%, between Year 2006 and Year 2030, as shown in Table 4-1.

Table 4-1 NCTC Model Trips Summary (2006-2030)

	Number of Daily Trips			Share of Trips		
	Internal-Internal	Internal-External	Total	Internal-Internal	Internal-External	Total
Year 2006	251,704	29,760	281,464	89%	11%	100%
Year 2030	320,755	53,517	374,272	86%	14%	100%
Growth	69,051	23,757	92,808	74%	26%	100%

Source: NCTC TransCAD Traffic Model, Prism Engineering, 2007.

As described above, the NCTC Model has an “internal” modeling area illustrated in Figure 4-1 and several “external” cordons that capture the contribution of external areas to traffic on NCTC roadways. The majority of new trips, 74%, will both start and end in the internal NCTC Modeling area. The NCTC Model estimates about 26% of new trips to be between internal and external areas.

It is important to note that not all of the total traffic growth captured in the NCTC Model O-D tables will be generated by new development inside the RTMF Collection Area. It is necessary to determine this portion in order to develop an appropriate RTMF Fee Schedule. In other words, since the RTMF Target Collections represent improvement needs of new development inside the RTMF Collection Area, so too should the trip estimates used in conjunction with the RTMF Target Collections to develop the RTMF Fee Schedule.

The NCTC Model’s internal zones roughly correspond to the NCTC RTMF Collection Area. Thus, the portion of traffic growth attributable to new development inside the NCTC RTMF Collection Area includes only those trip ends located in one of the internal NCTC Model zones. The portion consists of both trip ends of the “internal to internal” trips and only the internal trip end of the “internal to external” and “external to internal” trips. This results in 69,051 plus half of 23,757 trips, or a total of 80,929 trips attributable to new development inside the RTMF Collection Area.

Figure 4-1 NCTC TransCAD Traffic Model (2007) – Modeling Area



Source: NCTC TransCAD Traffic Model, Prism Engineering, 2007.

4.1.3. Converting Model Forecasts to Project Level Forecasts

The next step in developing the necessary input for the RTMF fee calculation, was converting the number of forecasted model “trips” into “trip ends” or project level forecasts in order to be consistent with the RTMF implementation process.

Model forecasts correspond to the total number of trips generated in the modeling region. Project level forecasts are computed for a specific development typically using trip generation rates from the Institute of Transportation Engineers (ITE) Trip Generation manual or another source. The NCTC RTMF program is implemented by computing a given development’s fee obligation as follows: the fee rate is multiplied by the specific development’s trip generation rate as prescribed by the NCTC RTMF program’s Administrative Manual to yield the fee obligation for that particular development. Since fees are assessed on new development that could represent either end of a model forecast trip, it follows that the fee rate should be set based on trip ends or project level forecasts.

The total project level forecasts for a region are about twice the model level forecasts since project level forecasts are computed for each of the two trip ends of a single model trip. This can best be understood with an example. Consider a trip made from someone’s home to their office. The model would count this as one trip. This one model trip is comprised of two trip ends: one trip end being the home and the other being the office. The project level trip generation for the house plus the project level trip generation for the office would yield two trip ends (i.e. one at the house end and one at the office end).

Applying this simple one to two relationship between model and project forecasts, it follows that two times 80,929, or 161,858, project level trips are attributable to new development in the RTMF Collection Area.

4.2. Fee Category Share of New Trips

The current RTMF Fee Schedule consists of a single fee per trip end for all land-use categories. However, the current RTMF program exempts non-residential land-uses (i.e. attraction category) located in Fee Zones 2-7 from payment of the fee as a matter of policy as indicated in the following excerpt from the current Administrative Manual:

“Developments in the Land Use Attraction Category contained in Table 2 on page 11 that are located in Fee Zones 2-7. These developments have the effect of reducing trips into Zone 8, and thus helps reduce traffic impacts on the Capital Improvement Projects located in Zone 8.” [Administrative Manual, page 20]

Any exemption from fee payment leaves a hole in the fee program, i.e. a portion of the target collections that will not be collected. In order to avoid this outcome, it was determined that this policy of encouraging development of non-residential land-uses in Zones 2-7 be incorporated through differentiation of fee levels by land-use type, rather

than through exemption of these land-uses from the RTMF program. It was further determined that two land use categories would be included in the 2008 Fee Schedule Update:

- Residential
- Non-Residential

The fee for each rate category is based on the portion of future trip growth attributable to each of them. The NCTC Model was the key tool in determining the distribution of trips between the two fee rate categories. The NCTC Model breaks internal-to-internal trips down into six trip-purpose categories based on the type of land use at each of a trip's two endpoints:

1. Home-Based-Work (HBW): One trip end is a residence and the other trip end is a workplace.
2. Home-Based-Shopping (HBSH): One trip end is a residence and the other trip end is a retail land-use.
3. Home-Based-School (HBSC): One trip end is a residence and the other trip end is a school.
4. Home-Based-Other (HBO): One trip end is a residence and the other trip end is a non-residential land-use not fitting into one of the other categories (workplace, shopping venue, or school).
5. Non-Home-Based-Work (NHBW): Neither trip end is the traveler's home. One trip end is the traveler's workplace.
6. Non-Home-Based-Other (NHBO): Neither trip end is the traveler's home or workplace.

Table 4-2 shows the distribution of internal-internal trips amongst the six categories. Since trips between internal and external NCTC Model zones were not broken down into these five trip purposes categories by the NCTC Model, the distribution of internal-internal trips into the six categories was applied as an approximation.

The six trip purpose categories relate to the two fee categories (residential and non-residential) as shown in Table 4-3 and Table 4-4. Table 4-3 shows how the model data determined the distribution of RTMF CIP costs between the two fee categories. The full share of HBW, HBSH, HBSC, and HBO trips were allocated to the residential fee category, while the full share of NHBW and NHBO trips were allocated to the non-residential category. This methodology is consistent with NCHRP Report #187 Quick Response Urban Travel Estimation Techniques and Transferable Parameters User's Guide (Transportation Research Board, 1978), which details operational travel estimation techniques that are universally used for travel demand modeling. Chapter 2 of this report states that "HBW (Home Based Work) and HBNW (Home Based Non Work) trips are generated at the households, whereas the NHB (Non-Home Based) trips are generated elsewhere." This methodology results in 66.7% of RTMF CIP costs attributed to the residential land-use category, and the remaining 33.3% attributed to the non-residential category.

Table 4-2 Distribution of NCTC Model Internal-Internal Trips

	HBW	HBSH	HBSC	HBO	NHBW	NHBO
Year 2006	19.6%	15.1%	10.3%	25.0%	5.9%	24.1%
Year 2030	19.1%	14.9%	10.5%	24.8%	5.9%	24.8%
Growth	17.0%	14.2%	11.3%	24.2%	5.8%	27.5%

Note: Rows may not total 100% due to rounding.

Source: NCTC TransCAD Traffic Model, Prism Engineering, 2007.

Table 4-3 NCTC RTMF CIP Costs by Fee Categories

	HBW	HBSH	HBSC	HBO	NHBW	NHBO	TOTAL
Residential	17.0%	14.2%	11.3%	24.2%			66.7%
Non-Residential					5.8%	27.5%	33.3%
Total	17.0%	14.2%	11.3%	24.2%	5.8%	27.5%	100.0%

Note: Values shown in table are rounded. Fee calculation based on non-rounded values.

The portion of RTMF CIP costs attributed to each fee category provides one of the key variables in the fee calculation. The second key variable, the number of trip ends forecasted for each fee category, was determined as shown in Table 4-4. The methodology shown in Table 4-4 was developed to be consistent with the RTMF fee collection mechanism by which fees are collected from each development based on the trips generated by that development. The table shows that home-based trips have one trip end in the place of residence and the second trip end in a non-residential land-use. Non-home-based trips have both trip ends in a non-residential land-use.

Table 4-4 NCTC Model Trips by Fee Categories

	HBW	HBSH	HBSC	HBO	NHBW	NHBO	TOTAL
Residential	8.5%	7.1%	5.65%	12.1%			33.35%
Non-Residential	8.5%	7.1%	5.65%	12.1%	5.8%	27.5%	66.65%
Total	17.0%	14.2%	11.3%	24.2%	5.8%	27.5%	100.0%

Note: Values shown in table are rounded. Fee calculation based on non-rounded values.

5.0 RTMF COLLECTION TARGET

Based on the RTMF CIP described in **Section 3.0**, the total value of needed improvements to the regional roadway system in western Nevada County exceeds \$281 million. However, only a portion of this amount will be collected through the RTMF program. The RTMF CIP is broken down into three categories: Tier 1, Tier 2, and State Highway. Three million dollars will be collected through the RTMF program to provide seed money for the projects in the State Highway category whose cost estimates total about \$212.1 million.

Projects in the Tier 1 and Tier 2 categories total approximately \$69.0 million. Only a portion of this amount can be attributed to improvement needs necessary to mitigate the cumulative regional transportation impacts of new development. Some of the Tier 1 and Tier 2 improvements address existing transportation needs that have not been caused by the impact of new development (although new development may exacerbate the existing need). Also, some projects in Tier 1 and Tier 2 will be funded in-part through other sources. The portion of projects attributable to existing needs or funded through other sources will not be collected for through the RTMF program.

This section of the Nexus Study report quantifies the share of RTMF CIP costs attributable to new development and not likely to be satisfied by other available funding sources. This portion will be assessed to developers through the payment of the RTMF. In addition, the RTMF Collection Target will include an estimate of administrative costs. The sections below explain in detail the methodology and resulting RTMF Collection Target.

5.1. Portion of Deficiency Attributable to Growth versus Existing Need

As noted in **Section 2.0**, there is a marked deterioration in roadway performance from existing to future 2030 conditions. A methodology was developed to breakdown the future deficiency into two portions:

- The portion attributable to existing conditions (i.e. existing need)
- The portion attributable to growth

Deficiency at intersection and ramps was quantified in terms of AM and PM peak hour delay, while deficiency on roadway segments was quantified in terms of daily volume-to-capacity (V/C) ratios, for both existing and future conditions. NCTC and its member agencies defined a deficient facility as one at LOS E or worse. The thresholds corresponding to LOS E or worse conditions are as follows:

- Delay > 35 seconds at stop-controlled locations
- Delay > 55 seconds at signalized locations
- V/C > 0.9

The delay or V/C value for a given location minus the threshold value was the estimated magnitude of that location's deficiency. For example, a segment with a V/C of 1.300 under existing conditions would have an existing deficiency of 0.400 (1.300 – 0.900). A segment with a future V/C of 1.500 would have a future deficiency of 0.600. This segment's deficiency would have grown by 0.200 between existing and future conditions.

Next, the future deficiency was broken down into the two portions described above:

- The portion attributable to existing conditions (i.e. existing need)
- The portion attributable to growth

The portion of future deficiency attributable to existing conditions (i.e. existing need) was estimated by the following relationship:

$$\text{Existing Need} = \frac{\text{Existing Deficiency}}{\text{Future Deficiency}} = \frac{\text{Existing Delay or V/C} - \text{Threshold}}{\text{Future Delay or V/C} - \text{Threshold}}$$

The portion of future deficiency attributable to growth is the remaining portion, or 100% less the existing need. Alternatively, the growth share can be calculated as follows:

$$\text{Growth Share} = \frac{\text{Growth in Deficiency}}{\text{Future Deficiency}} = \frac{\text{Future} - \text{Existing Delay or V/C}}{\text{Future Delay or V/C} - \text{Threshold}}$$

It should be noted that where the existing delay or V/C is less than or equal to the threshold, there is no existing deficiency and therefore existing need is 0% making any future deficiency 100% attributable to growth.

In terms of the example, the existing deficiency was 0.400 while the future deficiency was 0.600. Thus, the portion of the future deficiency attributable to existing conditions (existing need) was 0.400/0.600 or 67%. The portion attributable to growth was 100%-67%, or 33%. This can alternatively be calculated as the growth in deficiency (1.500-1.300 = 0.200) divided by the future deficiency (0.200/0.600 = 33%). This is a typical methodology applied to determine existing need for mitigation fee programs.

While segments were analyzed based on daily conditions, intersections and ramps were analyzed for both AM and PM peak period conditions. Improvements at intersections and ramps were sized based on the worst case conditions, either AM or PM. Likewise,

the existing need and growth share for these locations were based on the worst case conditions, either AM or PM.

This methodology was applied to most of the RTMF CIP projects, with a few special cases as described below:

- Project 1- Dorsey Drive Interchange: The growth share for this project was based on model data that showed 10,000 vehicles under existing conditions and 15,000 vehicles under future conditions would use the interchange. Thus, a growth share of 33% (5,000/15,000) was assumed for this project.
- Project 13A & 13B - Ridge Rd/ Gold Flat Rd/SR 20/49 NB Ramps; Ridge Rd/ Gold Flat Rd/ SR 20/49 SB Ramps; and Zion St/Ridge Rd: A growth share of 78% was assumed for this location based on the weighted average of the three constituent intersections. The growth share for each intersection was weighted by the cost estimate for that intersection as follows:

$$\frac{[\$1,311,800 * (457-210)/(457-35)] + [\$1,173,000 * (93-51)/(93-35)] + [\$1,515,200 * 1]}{\$1,311,800 + \$1,173,000 + \$1,515,200}$$

- Project 29 - E Main St/ Bennett St: A growth share of 100% was assumed for this project which has already been constructed as part of the original RTMF program, but using other funds with an agreement to reimburse.
- Project 38 - Dorsey Drive Extension: The growth share for this project was based on the PM peak trips on parallel roadways and intersections. It was estimated that of the 4,091 future trips, 1,619 would be growth trips and therefore a growth share of 40% (1,619/4,091) would be assumed for this project.

Table 5-1 summarizes the growth share assumed for each of the RTMF CIP projects.

Table 5-1 RTMF Target Collections
(Page 1 of 2)

#	LOCATION	PROPOSED IMPROVEMENT	COST ESTIMATE ****	LEVEL OF SERVICE ANALYSIS								GROWTH SHARE CALCULATION***				TIER NUMBER & PROJECT PRIORITY				
				LOS Analysis Method			Updated Analysis from Fehr & Peers - November '07**					Worst Case (AM or PM)	Growth Share	Other Funding	Share of Cost in RTMF					
				Type of Analysis	Measure	Threshold	Existing AM*		Existing PM*		Future 2030 AM*					Future 2030 PM*				
1	Dorsey Drive Interchange	Construct new interchange.	\$34,950,000	New IC	New IC	not applicable	not applicable						not applicable	33%		\$11,533,500	Tier 1	1		
2A	SR 49, south of McKnight Way	Widen highway consistent with design concepts approved by NCTC.	\$53,500,000	Daily V/C	Daily V/C	0.9	18,000	25,500	1.417	F	18,000	34,710	1.928	F	Daily	50%		*****	State Highway	15
2B	SR 49, south of La Barr Meadows Rd	Widen highway consistent with design concepts approved by NCTC.	\$27,700,000	Daily V/C	Daily V/C	0.9	18,000	28,000	1.556	F	18,000	37,210	2.067	F	Daily	44%		*****	State Highway	15
2C	SR 49, south of Alta Sierra	Widen highway consistent with design concepts approved by NCTC.	\$102,300,000	Daily V/C	Daily V/C	0.9	18,000	22,600	1.256	F	18,000	31,810	1.767	F	Daily	59%		*****	State Highway	15
2D	SR 49, south of Wolf Creek	Widen highway consistent with design concepts approved by NCTC.	\$26,200,000	Daily V/C	Daily V/C	0.9	18,000	22,300	1.239	F	18,000	31,510	1.751	F	Daily	60%		*****	State Highway	15
3	SR 49/ Combie Rd	Provide second southbound left-turn lane with receiving lane.	\$2,345,800	Signal	AM/PM Delay (secs)	55	34	C	26	C	57	E	40	D	AM	100%		\$2,345,800	Tier 2	6
4A & 4B	SR 49 NB Ramps/ E McKnight Way & SR 49 SB Ramps/ W McKnight Way	Install roundabout.	\$5,499,457	AWSC	AM/PM Delay (secs)	35	not available		153	F	not available		247	F	PM	44%		\$2,438,438	Tier 2	8
6	SR 20 EB Ramps/ McCourtney Rd	Install single-lane roundabout or traffic signal.	\$1,290,215	SSSC	AM/PM Delay (secs)	35	527	F	193	F	50 - ERI	F	1000	F	PM	84%		\$1,078,967	Tier 2	11
10	SR 20/49 NB Ramps/ Idaho-Maryland Rd	Install signals.	\$1,143,935	SSSC	AM/PM Delay (secs)	35				B			>150	F	AM	100%	\$147,000	\$996,935	Tier 2	10
11	SR 20/49 SB Ramps/ Idaho-Maryland Dr/ E Main St	Install two-lane roundabout.	\$2,600,000	AWSC	AM/PM Delay (secs)	35	78	F	134	F	196	F	179	F	AM	73%	\$777,000	\$1,823,000	Tier 1	2
12	SR 20/49 SB Ramps/ Brunswick Rd	Widen Brunswick Road and add second lane to on-ramp.	\$892,279	Signal	AM/PM Delay (secs)	55	--	--	52	D	--	--	72	E	PM	100%		\$892,279	Tier 2	5
13A & 13B	Ridge Rd/ Gold Flat Rd/SR 20/49 NB Ramps; Ridge Rd/ Gold Flat Rd/ SR 20/49 SB Ramps; and Zion St/Ridge Rd	Install intersection improvements: roundabout or signals. Close spacing of intersections necessitates improvement at all three intersections.	\$4,000,000	SSSC	AM/PM Delay (secs)	35	49	E	210	F	118	F	457	F	PM	78%		\$3,132,421	Tier 1	4
							27	D	51	F	34	D	93	F						
							na	D	na	D	na	F	na	F						

5.2. Other Funding Sources

As noted previously, the RTMF CIP is broken down into three categories: Tier 1, Tier 2, and State Highway. Three million dollars will be collected through the RTMF program to provide seed money for the projects in the State Highway category whose cost estimates total about \$212.1 million.

Projects in the Tier 1 and Tier 2 categories total approximately \$69.0 million. It is expected that some of these projects will be funded through sources other than the RTMF program. These projects, and the portion of other funding available are listed below:

- Project 10 - SR 20/49 NB Ramps/ Idaho-Maryland Rd: \$147,000, Caltrans
- Project 11 - SR 20/49 SB Ramps/ Idaho-Maryland Dr/ E Main St: \$777,000, City of Grass Valley
- Project 22 & 23 - Brunswick Rd/ Loma Rica Dr & Brunswick Rd/ E Bennett St/ Greenhorn Rd: \$2,013,000, County
- Project 24 - Brunswick Rd/ SR 174 Colfax Highway: \$2,860,364, Caltrans
- Project 36 - SR 20/ Rough and Ready Highway: \$1,000,000, Caltrans

It is also expected that some portion of the RTMF CIP will be constructed through developer dedications. Dedications are right of way and/or completed roadway segments that are required to be completed by developers as part of their development approvals. Such contributions to the RTMF program will be credited to the developer as described in the program's Administrative Manual. The estimated value of developer dedications is not offset from the RTMF Collection Target since it will be credited to developers on a case-by-case basis.

5.3. Administrative Costs

Administration of the RTMF program by NCTC currently is funded from other sources. As part of this update, a nominal amount is set aside for future administration of the RTMF program. Based on past administrative needs and with consideration for the relative magnitude of the updated program relative to the original program, NCTC estimates annual administrative costs of \$10,000 for each year through the 2030 program horizon year.

Section 66001 (d) of the Mitigation Fee Act requires that a comprehensive review of a mitigation fee program be completed at least every five years. NCTC estimates a cost of approximately \$100,000 per review. It was further estimated that four reviews would occur through the 2030 horizon year.

Combining the costs for annual administration and five-year comprehensive reviews, a total of \$620,000 ($\$10,000 \times 22 + \$100,000 \times 4$) is included in the RTMF Collection Target as a set aside for administrative of the RTMF program.

5.4. RTMF Collection Target

Having determined the value of improvements that can be attributed to existing needs, the share of the RTMF CIP costs that will be derived from other funding sources, and the set aside for administrative of the RTMF program, it is possible to establish the RTMF Collection Target. The RTMF Collection Target is the second key variable needed to determine the RTMF Fee Schedule.

Table 5-1 summarizes the adjustment of the total cost for the NCTC RTMF CIP as the basis for establishing the rough proportion of improvement costs allocable to new development through the RTMF program. For each project, the share of costs included in the RTMF is the lesser of either the growth share of the cost or the unfunded portion of the cost. For example, Project 36 (SR 20/ Rough and Ready Highway) has a total cost of \$2,492,600, 100% of which is attributable to development. However, \$1,000,000 of State funding is expected to be available for this project. Thus, the share of costs included in the RTMF program is \$1,492,600 ($\$2,492,600 - \$1,000,000$) for this project.

As can be seen in Table 5-1, the RTMF Collection Target totals \$35,560,359. This includes the unfunded, growth share of Tier 1 and Tier 2 projects, \$3,000,000 for State Highway projects, and \$620,000 for RTMF program administration.

6.0 FEE CALCULATION

The fee amounts that will need to be collected to mitigate the cumulative regional impacts of new development on the regional roadway system in western Nevada County are quantified in this section. The fee schedule includes a fee per trip for two land use categories: residential and non-residential.

Table 6-1 shows the fee calculation which is divided into four steps. Step 1 summarizes the development of the RTMF Collection Target, described in detail in **Section 5.0**. Step 2 shows the portion of the RTMF Collection Target attributable to each of the fee categories: residential and non-residential. Step 3 calculates the number of new trips attributable to each of the two fee categories. **Section 4.0** provides additional detail on the factors used in Steps 2 and 3. Finally, in Step 4 the fee per trip is calculated for residential and non-residential land uses by dividing the RTMF Collection Target by the new trips attributable to each, respectively. This yields a fee per trip of \$439 for residential land-uses and \$110 for non-residential land-uses.

Table 6-1 NCTC RTMF Fee Calculation

	ITEM DESCRIPTION	VALUE	SOURCE OR FORMULA
PART I: RTMF COLLECTION TARGET			
A	Total System Cost	\$72,649,988	See Table 5-1
B	Total System Cost Attributable to Existing Need or Other Funding Sources	\$37,089,629	See Table 5-1
C	RTMF Collection Target	\$35,560,359	$C = A - B$
PART II: COST ATTRIBUTABLE TO LAND USE CATEGORY			
D	Share of Cost Attributable to Residential	66.72%	See Table 4-3
E	Share of Cost Attributable to Non-Residential	33.28%	
F	RTMF Collection Target Attributable to Residential	\$23,726,987	$F = C * D$
G	RTMF Collection Target Attributable to Non-Residential	\$11,833,372	$G = C * E$
PART III: NEW PROJECT LEVEL TRIPS			
H	Total New Average Weekday Trip Ends	161,858	See Section 4.1
I	Residential Share of Trips	33.36%	See Table 4-4
J	Non-Residential Share of Trips	66.64%	
K	New Average Weekday Residential Trip Ends	53,998	$K = H * I$
L	New Average Weekday Non-Retail & Hotel Trip Ends	107,860	$L = H * J$
PART IV: FEE PER TRIP			
M	Residential Fee per Trip	\$439	$M = F / K$
N	Non-Residential Fee per Trip	\$110	$N = G / L$

7.0 RECOMMENDATIONS AND CONCLUSION

Based on the results of the Nexus Study evaluation, it has been possible to determine a reasonable relationship between the cumulative regional impacts of new land development projects in western Nevada County on the regional roadway system and the need to mitigate these transportation impacts using funds levied through the RTMF program. The reasonable relationship between the impact of new development and the need for the RTMF can be summarized as follows:

- Western Nevada County is expected to continue to grow as a result of new residential and non-residential development in the future.
- The continuing residential and non-residential growth in western Nevada County will result in increasing congestion on regional roadways due to the impact of newly created trips and traffic demand.
- Future roadway congestion is directly attributable to the cumulative regional transportation impacts of future development in western Nevada County.
- Capacity improvements to the regional roadway system will be needed to mitigate the cumulative regional impacts of new development.
- Revenues from other established funding sources will not be sufficient to address all the regional roadway improvements needed to mitigate the impacts of new development.
- The regional roadway improvements identified in the RTMF CIP are roadway facilities that will provide additional capacity to help mitigate the impacts of new development and merit inclusion for funding improvements through this fee program.

The Nexus Study evaluation has established a proportional “fair share” of the improvement cost attributable to new development based on the proportion of future deficiency attributable to growth and the availability of other funding sources. Furthermore, the Nexus Study evaluation has divided the fair share of the cost to mitigate the cumulative regional impacts of future new development in western Nevada County in rough proportionality to the trips that will be generated by future residential and non-residential development. The respective fee allocable to future new residential and non-residential development in western Nevada County is summarized in Table 7-1.

Table 7-1 RTMF Program 2008 Fee Schedule Update

Land Use Category	Fee per Trip
Residential	\$439
Non-Residential	\$110

7.1. Annual Inflation Adjustment

The resolution supporting adoption of this 2008 Fee Schedule Update will include provisions that provide for an annual review and adjustment of the RTMF schedule of fees to account for cost inflation. To ensure the RTMF program revenues are adequate to accomplish the improvements recommended in the RTMF CIP, it is appropriate to regularly adjust the underlying cost assumptions to reflect inflation. Specifically, the project costs identified in the RTMF CIP should be adjusted annually to reflect the influence of right-of-way and construction cost inflation. Based on the revised improvement cost information, the RTMF Fee Schedule can be recalculated and the fees adjusted accordingly to sustain the value of the program.

As the basis for completing an annual inflationary adjustment to the RTMF program, it is recommended that NCTC utilize separate indices for right-of-way and construction costs. By applying the respective index for right-of-way and construction costs, NCTC can adjust the project cost values presented in the RTMF CIP and summarized in Table 5-1 of this report. The resultant total cost value can then be used as the basis for recalculating the RTMF Fee Schedule as presented in Table 6-1.

For right-of-way cost adjustments, it is recommended that NCTC utilize the "Existing Home Price Trend" compiled by the National Association of Realtors (NAR) to track the median sales price of existing single family homes in metropolitan areas across the country. The median sales price of existing single family homes represents the most widely available index of property values providing a relative measure of property values in a given area over time. Although the acquisition of right-of-way may involve some properties other than existing single family homes, this index provides a reasonably concise and readily accessible source of data reflecting the overall trend in land values.

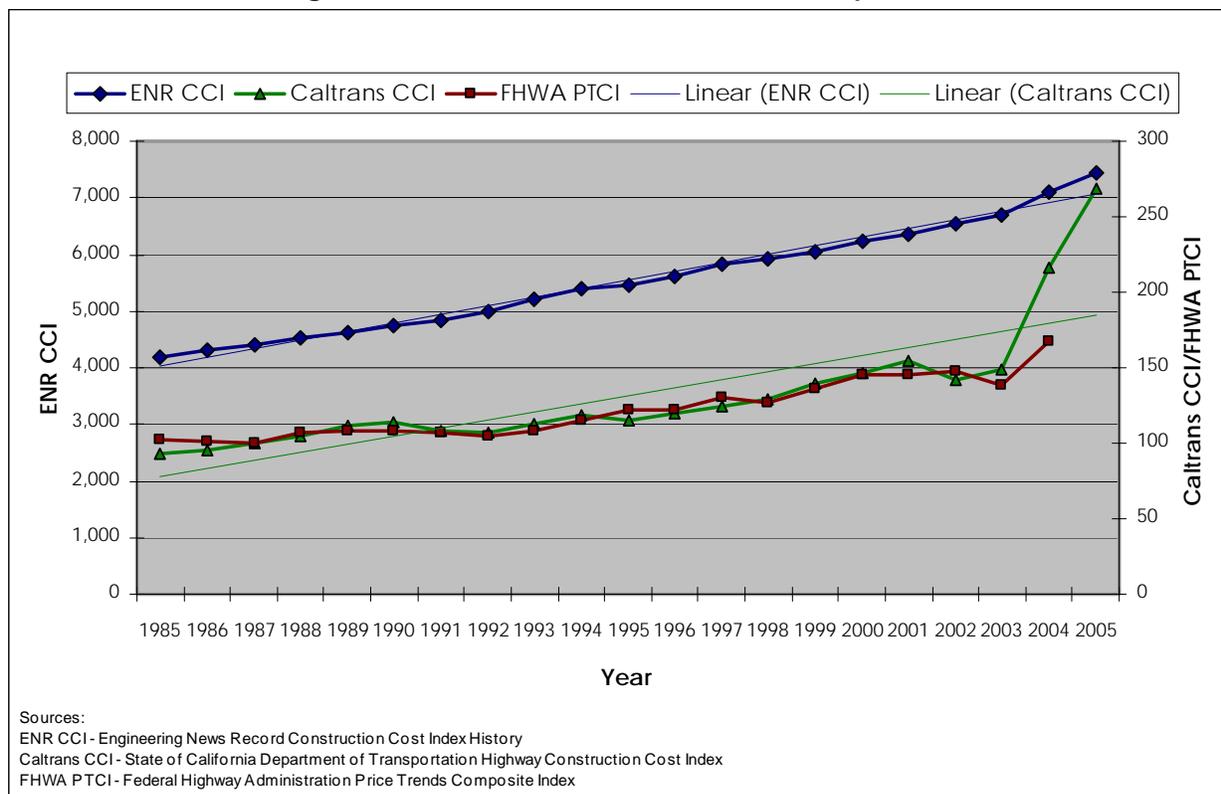
For construction costs, NCTC should utilize the Engineering News Record (ENR) Construction Cost Index (CCI). The ENR CCI represents the most widely accepted standard index for assessing changes in construction material and labor costs over time based on a monthly survey of the largest metropolitan markets in the United States. ENR builds its construction cost index by developing a twenty city average of the combined costs for labor and various common construction materials.

The use of the national ENR CCI represents a more stable index over time by reducing the influence of local short term fluctuations in the supply of materials and labor. The application of a more stable index for adjusting cost values is recommended to reduce the potential for erratic fluctuation in the RTMF Fee Schedule as part of the annual adjustment.

Figure 7-1 compares the ENR CCI with the Caltrans Highway CCI and the FHWA Price Trends Composite Index from 1985 to 2005. The comparison of the three indices illustrates the greater stability of the ENR CCI over a twenty-year time frame compared to the remaining two indices. Figure 7-1 also includes linear trend lines for both the ENR

CCI and the Caltrans Highway CCI. As can be seen in the graph, the linear trend for the two indices is almost identical despite the greater volatility of the Caltrans index.

Figure 7-1 Construction Cost Index Comparison



To facilitate the annual adjustment of the RTMF program’s Fee Schedule, it would be appropriate for NCTC to establish a schedule of specific milestone dates for the annual adjustment process to correspond with local jurisdiction budget approval cycles. Key milestones may include determination of the respective indices, recalculation of the fee schedule, adoption of the revised schedule of fees by NCTC and final implementation of the updated fee schedule by the local jurisdictions.

7.2. Regular Program Review and Update

Section 66001 (d) of the Mitigation Fee Act requires that a comprehensive review of a mitigation fee program be completed at least every five years. NCTC needs to establish a process for the regular comprehensive review and update of the RTMF program. The comprehensive review is intended to reaffirm the purpose of the fee and the reasonable relationship between the fee and the purpose for which it is being charged, and to reassess the program’s financial status to ensure the designated improvements can be fully funded.

The comprehensive review also provides the opportunity to update the program to respond to changing needs within the area. In particular, successive updates provide

the opportunity to utilize the latest available demographic and travel demand forecast information for the area to reflect changing rates and patterns of development. By responding to changing development trends, the program can be adjusted as necessary to adequately address the improvement needs resulting from changes in development activity.

In accordance with the provision of the Mitigation Fee Act, it is recommended that NCTC undertake a comprehensive review and update of the RTMF program within five years of the date of adoption of this Nexus Study. In addition to meeting the intents of the Mitigation Fee Act by reaffirming the rational nexus for the RTMF program, NCTC should use the comprehensive review and update as an opportunity to reevaluate the program within the context of changing development patterns and improvement needs.